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FINAL TECHNICAL REPORT

ON

U.S. FRANCE WORKSHOP ON GaAs MICROSTRUCTURES  
AND HIGH PERFORMANCE DEVICES

HELD

JUNE 8-10, 1981

AT

COPLEY PLAZA HOTEL

BOSTON, MASS

AD A110884

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Report Prepared by

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The U. S./France Workshop on Gallium Arsenide Microstructures and High Performance Devices, held June 8-10, 1981 in Boston, is discussed and the titles of scheduled papers and authors are presented.		

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**U.S. FRANCE WORKSHOP ON GaAs MICROSTRUCTURES  
AND HIGH PERFORMANCE DEVICES**

This meeting is the return meeting, following one in Paris in November 1979. U.S. attendees to the first meeting were supported by the National Science Foundation, while the Office of Naval Research supported the present meeting.

At this meeting, all key technical attendees were scheduled to present talks. The attached program covers the titles of the technical presentation, along with the names of the people presenting the talks. As with the previous meeting, a mix of U.S. and French presentations was attempted on each broad topic.

The discussions after each paper, during luncheons together, and in panel sessions were lively. Both sides shared ideas and problems in a mutually beneficial manner.

In the opinion of the author, France is fast becoming "the Japan of Europe" in the area of microelectronics applied research. This meeting and other interactions in these fields are therefore very valuable.

In order to minimize expense to ONR, industrial attendees from the U.S. were asked to support themselves. A surplus of funds resulted and will be returned to ONR.

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**U.S. - FRANCE WORKSHOP ON GaAs MICROSTRUCTURES  
AND HIGH PERFORMANCE DEVICES PROGRAM**

OVAL ROOM  
Copley Plaza Hotel  
Boston, Mass

Co-Chairmen  
L.F. Eastman, Cornell University  
M. Yoder, ONR

J. L. Teszner, DRET  
E. Constant, CHS, Lille

JUNE 8-10, 1981

**MONDAY MORNING, JUNE 8 - BULK AND EPI GROWTH, M. Yoder, Chairman**

- 9:00 - 9:20 R. Linares, Microwave Associates  
GROWTH AND PROPERTIES OF LEC GROWN SEMI-INSULATING GaAs
- 9:20 - 9:40 G. Martin, LEP  
OXYGEN RELATED GETTERING OF Si DURING GROWTH OF BULK  
GaAs CRYSTALS
- 9:40 - 10:00 J. P. Duchemin, Thomson CSF  
STATE OF THE ART OF MOCVD FOR GaAs AND GaInAs MATERIALS
- 10:00 - 10:20 R. Calawa, Lincoln Lab  
THE USE OF  $AsH_3$  IN THE MBE GROWTH OF GaAs
- 10:20 - 10:50 BREAK
- 10:50 - 11:10 A. Munoz, LAAS  
CRYSTALLOGRAPHIC DEFECTS IN GaAs GROWN BY MBE
- 11:10 - 11:30 C. Wood, Cornell University  
MBE-GROWN III-V ALLOYS FOR MICROWAVE AND OPTICAL  
DEVICE APPLICATIONS
- 11:30 - 11:50 R. Pucell, Raytheon  
MONOLITHIC GaAs MICROWAVE INTEGRATED CIRCUITS
- 11:50 - 12:15 DISCUSSION
- 12:15 - 2:00 LUNCH

**MONDAY AFTERNOON, JUNE 8 - SESSION I - BULK AND EPI ASSESSMENT,  
J. Zylberstejn, Chairman**

- 2:00 - 2:20 P. N. Favennec, CNET  
IMPURITIES REDISTRIBUTION IN III-V COMPOUNDS

- 2:20 - 2:40 S. Makram-Ebeid, LEP  
EXODIFFUSION PROPERTIES OF DEFECTS IN BULK GaAs
- 2:40 - 3:00 C. Evans, Evans Associates  
COMPOUND SEMICONDUCTOR BULK AND EPITAXIAL MATERIAL  
ASSESSMENT
- 3:00 - 3:20 D. Hobgood, Westinghouse Research  
GROWTH AND CHARACTERIZATION OF LARGE DIAMETER UNDOPE  
SEMI-INSULATING GaAs FOR DIRECT ION IMPLANTED FET  
TECHNOLOGY
- 3:20 - 3:50 BREAK
- 3:50 - 4:10 R. H. Wallis, Thomson CSF  
MOBILITY PROFILING IN SHORT-GATE MESFET's BY  
MAGNETO-TRANSCONDUCTANCE MEASUREMENTS

MONDAY AFTERNOON, JUNE 8 - SESSION II - SHORT OPTICAL PULSE MEASUREMENTS  
OF ELECTRON DYNAMICS, J. Ballantyne, Chairman

- 4:10 - 4:30 C. Shank, Bell Laboratory  
PICOSECOND DYNAMICS OF HIGHLY EXCITED GaAs AND MULTI-  
QUANTUM WELL STRUCTURES
- 4:30 - 4:50 R. L. Fork, Bell Laboratory  
PICOSECOND NONEQUILIBRIUM TRANSPORT IN GaAs

MONDAY EVENING, JUNE 8 PANEL SESSION, 8:30 PM - MATERIALS FOR HIGH  
SPEED/HIGH FREQUENCY DEVICES

H. Gatos, Chairman, M. Yoder, J. P. Duchemin, J. Zylberstejn

TUESDAY MORNING, JUNE 9 - SUBMICRON TECHNOLOGY AND MEASUREMENTS,  
J. L. Teszner, Chairman

- 8:30 - 8:50 C. L. Anderson, Hughes Research  
FOCUSED ION BEAM FABRICATION OF CHANNEL REGIONS FOR  
GaAs FET's OR BIPOLARS
- 8:50 - 9:10 B. Fay, Thomson CSF  
X-RAY REPLICATOR FOR SUBMICRON LITHOGRAPHY:  
PRELIMINARY RESULTS
- 9:10 - 9:30 H. Rupprecht, IBM  
SOME NEW ASPECTS OF GaAs MESFET TECHNOLOGY
- 9:30 - 9:50 M. Laugier, INSA LYON  
OPTIMISATION OF PULSED ANNEALING TECHNIQUES FOR  
GaAs I.C.'s
- 9:50 - 10:20 BREAK

10:20 - 10:40 J. Perrocheau, Thomson CSF  
THERMAL LASER AND ELECTRON BEAM ANNEALING OF IMPLANTED  
GaAs: PRELIMINARY RESULTS

10:40 - 11:00 J. Zylberstejn, Thomson CSF  
SUBNANOSECOND D.L.T.S. STUDIES OF DEEP LEVELS IN GaAs  
MESFET'S

11:00 - 11:20 R. Castagne, IEF - ORSAY  
OVERSHOOT PHENOMENA IN SUBMICRON STRUCTURES

11:20 - 11:40 M. Voos, GPS - ENS  
OPTICAL PROPERTIES OF SEMICONDUCTOR SUPERLATTICES

11:40 - 12:15 DISCUSSION

12:15 - 2:00 LUNCH

TUESDAY AFTERNOON, JUNE 9 - HIGH SPEED/FREQUENCY DEVICES AND IC's,  
A. Murphy, Chairman

2:00 - 2:20 D. Boccon-Gibeaud, LEP  
DIVIDER BY 8

2:20 - 2:40 G. Nuzillat, Thomson CSF  
LOW POWER GaAs TECHNOLOGIES FOR DIGITAL IC's  
OPERATING IN THE 1-2 GB/S RANGE

2:40 - 3:00 R. Lee, Hughes Research  
MATERIALS REQUIREMENTS FOR GaAs HIGH SPEED CIRCUITS

3:00 - 3:20 D. Maignant, LEP  
WIDE BAND 6-12 GHz POWER AMPLIFIER

3:20 - 3:50 BREAK

3:50 - 4:10 P. Jay, Thomson CSF  
CHARACTERISATION TECHNIQUES APPLIED TO GaAs MMIC  
PROCESSING

4:10 - 4:30 S. Bandy, Varian  
GATE RESISTANCE PROBLEMS FOR SUB-HALF-MICRON DEVICES

4:30 - 4:50 R. Mattauch, University of Virginia  
ADVANCES IN MILLIMETER WAVE RECEIVER ELEMENTS

4:50 - 5:10 G. Rey, LAAS  
GaAlAs/GaAs MICROWAVE POWER BIPOLAR TRANSISTORS

TUESDAY, JUNE 9 - EVENING PANEL SESSION, 8:30 PM - PROCESSING AND DESIGN  
OF HIGH SPEED/HIGH FREQUENCY DEVICES, L. Eastman,  
Chairman, H. Dietrich, E. Constant, G. Nuzillat

WEDNESDAY MORNING, JUNE 10 - OPTICAL DEVICES, E. Constant, Chairman

- 8:30 - 8:50 F. Leonberger, Lincoln Lab  
HIGH SPEED InP OPTOELECTRONIC SWITCHES FOR SIGNAL  
PROCESSING APPLICATIONS
- 8:50 - 9:10 J. Ballantyne, Cornell University  
PHOTOCONDUCTIVE AND PLANAR-DOPED BARRIER OPTICAL  
DETECTORS IN III-V COMPOUNDS
- 9:10 - 9:30 A. Scavennec, CNET  
LOW-CURRENT HETEROJUNCTION TRANSISTOR FOR  
INTEGRATION AND PHOTODECTION
- 9:30 - 9:50 H. Taylor, NRL  
POSSIBLE APPLICATIONS FOR HIGH-SPEED OPTOELECTRONIC  
DEVICES
- 9:50 - 10:10 BREAK
- 10:10 - 10:30 C. Fonstad, MIT  
MATERIALS TECHNOLOGY FOR HIGH SPEED HETEROSTRUCTURE  
DEVICES
- 10:30 - 10:50 P. Devoldere, CNET  
A NEW STRIPE STRUCTURE FOR 1.3 MICROMETER LASER AND  
EDGE EMITTING LED

PANEL SESSION - OPTICAL DEVICES

- 10:50 - 11:30 H. Kressel, Chairman, J. Ballantyne
- 11:30 - 1:20 LUNCH

WEDNESDAY AFTERNOON, JUNE 10 - SUBMICRON DEVICES PHENOMENA, L. Eastman,  
Chairman

- 1:20 - 1:40 E. Constant, CHS Lille  
ABOUT PARTICULAR FEATURES OF SUBMICRON POWER FET
- 1:40 - 2:00 G. Salmer, CHS Lille  
VOLTAGE LIMITATIONS OF SUBMICRON FET's
- 2:00 - 2:20 M. Shur, University of Minnesota  
ELECTRON TRANSPORT IN SMALL SEMICONDUCTOR DEVICES
- 2:20 - 2:40 R. Malik, Cornell University and ERADCOM  
GaAs PLANAR DOPED BARRIER DIODES AND TRANSISTORS  
GROWN BY MBE
- 2:40 - 3:00 BREAK



3:00 - 3:20 N. T. Linh, Thomson CSF  
III-V COMPOUND MICROSTRUCTURES: TWO-DIMENSIONAL  
ELECTRON GAS FET - QUANTUM MECHANICAL TUNNELING

3:20 - 3:40 W. Frensley, Texas Instruments  
PROSPECTS FOR A HIGH-SPEED HIGH-DENSITY GaAs BIPOLAR  
TECHNOLOGY

3:40 - 4:00 C. Bozler, Lincoln Laboratory  
RECENT EXPERIMENTAL RESULTS ON THE PERMEABLE BASE  
TRANSISTOR

4:00 PM CLOSE WORKSHOP

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